

Claims

1. A light-emitting diode (100), comprising

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- a semiconductor layer structure including a substrate (10) and at least one light-generating layer (20) formed on said substrate (10) and one transparent current-spreading layer (30) deposited on said light-generating layer (20),
 - a first electrical contact layer on the back of said substrate, and
 - a second electrical contact layer (50) disposed on said current-spreading layer (30),

characterized in that

- the top surface of said current-spreading layer (30) has vertical structuring (40) to improve the decoupling of light, and
- said second electrical contact layer (50) has a lateral structure by means of which substantially uniform coupling of the electrical current into said current-spreading layer (30) can be achieved.

2. The light-emitting diode (100) as described in claim 1,

characterized in that

- said second electrical contact layer (50) is a central, in particular circular or square contact surface (51) and, arranged about said central contact surface (51), a contact structure (52; 53; 54) that is rotationally symmetrical with respect to the center point of said central contact surface (51) and is composed of relatively narrow contact webs (52; 53) and/or contact points (54).

3. The light-emitting diode (100) as described in claim 2,

characterized in that

- the rotational symmetry is a symmetry represented by a whole number and in particular matches the rotational symmetry of the light-emitting diode.

4. The light-emitting diode (100) as described in any of the preceding claims,

characterized in that

- said second electrical contact layer (5) is realized as continuous.

5. The light-emitting diode (100) as described in any of the preceding claims,

characterized in that

- said second electrical contact layer (50) is discontinuous and is interconnected by a layer of transparent, light-conducting material.

6. The light-emitting diode (100) as described in any of the preceding claims,

characterized in that

- said second electrical contact layer (50) is arranged on structured and/or unstructured portions of said current-spreading layer.

7. The light-emitting diode (100) as described in any of the preceding claims,

characterized in that

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- the vertical structuring (40) is in the form of preferably regularly arranged n-sided ($n \geq 3$) pyramids, frusta of pyramids, cones or frusta of cones.

8. A method for fabricating a light-emitting diode (100) as described in any of the preceding claims, characterized in that

- a light-generating layer (20) and thereafter a relatively thick and transparent current-spreading layer (30) are deposited on a substrate (10) and the back of said substrate is provided with a first electrical contact layer,
- vertical structuring (40) to improve the decoupling of light is produced in the surface of said current-spreading layer,
- a second electrical contact layer (50) having the desired lateral structure is deposited on the structured top surface of said current-spreading layer (30).

9. The method for fabricating a light-emitting diode (100) as described in any of claims 1 to 8, characterized in that

- a light-generating layer (20) and thereafter a relatively thick and transparent current-spreading layer (30) are deposited on a substrate (10) and the back of said substrate is provided with a first electrical contact layer,
- a second electrical contact layer (50) having the desired lateral structure is deposited on the top surface of said current-spreading layer (30), and
- vertical structuring (40) to improve the decoupling of light is produced in the top surface of said current-spreading layer (30) outside the areas of said second electrical contact layer.

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